

(c) For turbine engines, ratings and operating limitations are established relating to the following:

(1) Horsepower, torque, or thrust, r.p.m., gas temperature, and time for—

(i) Rated maximum continuous power or thrust (augmented);

(ii) Rated maximum continuous power or thrust (unaugmented);

(iii) Rated takeoff power or thrust (augmented);

(iv) Rated takeoff power or thrust (unaugmented);

(v) Rated 30-minute OEI power;

(vi) Rated 2½-minute OEI power;

(vii) Rated continuous OEI power; and

(viii) Rated 2-minute OEI Power;

(ix) Rated 30-second OEI power; and

(x) Auxiliary power unit (APU) mode of operation.

(2) Fuel designation or specification.

(3) Oil grade or specification.

(4) Hydraulic fluid specification.

(5) Temperature of—

(i) Oil at a location specified by the applicant;

(ii) Induction air at the inlet face of a supersonic engine, including steady state operation and transient over-temperature and time allowed;

(iii) Hydraulic fluid of a supersonic engine;

(iv) Fuel at a location specified by the applicant; and

(v) External surfaces of the engine, if specified by the applicant.

(6) Pressure of—

(i) Fuel at the fuel inlet;

(ii) Oil at a location specified by the applicant;

(iii) Induction air at the inlet face of a supersonic engine, including steady state operation and transient over-pressure and time allowed; and

(iv) Hydraulic fluid.

(7) Accessory drive torque and over-hang moment.

(8) Component life.

(9) Fuel filtration.

(10) Oil filtration.

(11) Bleed air.

(12) The number of start-stop stress cycles approved for each rotor disc and spacer.

(13) Inlet air distortion at the engine inlet.

(14) Transient rotor shaft overspeed r.p.m., and number of overspeed occurrences.

(15) Transient gas overtemperature, and number of overtemperature occurrences.

(16) Transient engine over-torque, and number of overtorque occurrences.

(17) Maximum engine overtorque for turbopropeller and turboshaft engines incorporating free power turbines.

(18) For engines to be used in supersonic aircraft, engine rotor windmilling rotational r.p.m.

(d) In determining the engine performance and operating limitations, the overall limits of accuracy of the engine control system and of the necessary instrumentation as defined in § 33.5(a)(6) must be taken into account.

[Amdt. 33-6, 39 FR 35463, Oct. 1, 1974, as amended by Amdt. 33-10, 49 FR 6850, Feb. 23, 1984; Amdt. 33-11, 51 FR 10346, Mar. 25, 1986; Amdt. 33-12, 53 FR 34220, Sept. 2, 1988; Amdt. 33-18, 61 FR 31328, June 19, 1996; Amdt. 33-26, 73 FR 48284, Aug. 19, 2008; Amdt. 33-30, 74 FR 45310, Sept. 2, 2009]

### § 33.8 Selection of engine power and thrust ratings.

(a) Requested engine power and thrust ratings must be selected by the applicant.

(b) Each selected rating must be for the lowest power or thrust that all engines of the same type may be expected to produce under the conditions used to determine that rating.

[Amdt. 33-3, 32 FR 3736, Mar. 4, 1967]

## Subpart B—Design and Construction; General

### § 33.11 Applicability.

This subpart prescribes the general design and construction requirements for reciprocating and turbine aircraft engines.

### § 33.13 [Reserved]

### § 33.15 Materials.

The suitability and durability of materials used in the engine must—

(a) Be established on the basis of experience or tests; and

(b) Conform to approved specifications (such as industry or military specifications) that ensure their having